

Patent
Attorney's Docket No. Q10091-001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of)	
Richard C. SCHLEGEL et al.)	Group Art Unit: 1813
Application No.: 08/216,506)	Examiner: A. Caputa
Filed: March 22, 1994)	
For: PAPILLOMAVIRUS VACCINE)	

DECLARATION PURSUANT TO 37 C.F.R. § 1.132

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

I, A. Bennett Jenson, declare and state as follows:

- (1) I am a co-inventor of the above-identified application.
- (2) I was awarded an M.D. from Baylor College of Medicine in 1966.
- (3) I am an author on numerous articles relating to papillomavirus research, particularly involving the role of human papillomaviruses in cervical cancer and the identification of conformational and non-conformational epitopes by the use of monoclonal antibodies.
- (4) I am an invited speaker at numerous scientific meetings which relate to human papillomavirus immunology and the study of human papillomavirus disease. My curriculum vitae is attached to this Declaration as Exhibit A.
- (5) I have reviewed the Office Action by Examiner Caputa issued on September 8, 1994. I also attended an interview with Examiner Caputa wherein the

Serial No. 08/216,506

issues raised in this Office Action were discussed. It is my understanding that the Examiner is of the opinion that there is insufficient evidence of record to distinguish the subject papillomavirus L1 proteins which exhibit the same conformation and reproduce the antigenicity of L1 proteins expressed on intact, native papillomavirus virions from the L1 proteins which are disclosed in Zhou et al., Journal of General Virology, 71, 2185-2190, (1990) or Zhou et al., Virology, 185 (1), 251 or 257, (1991).

(6) I have reviewed both of the Zhou et al. references identified above. Based on research conducted under my direct supervision, and also based upon independent research, it is my expert opinion that neither Zhou et al. reference describes the production of L1 proteins which reproduce the antigenicity and exhibit the same conformation as L1 proteins expressed by native, intact papillomavirus virions.

(7) I base my opinion upon the fact that both Zhou et al. references express a prototype HPV-16 L1 sequence which was initially cloned from a HPV-16 genome which had integrated into the chromosomes of a squamous cervical cell carcinoma. This is clear based upon the fact that both of the Zhou et al. references identify as the source of their HPV-16 L1 DNA, an HPV-16 DNA initially identified by Dürst et. al., (initially reported in Proc. Natl. Acad. Sci., USA, 80, 3812-3815 (1983)). For example, Zhou et al. (1991) identifies Dr. Gissman (a co-author on the Dürst et al. paper, *supra*) as the source of their HPV-16 L1 gene. Similarly, Zhou et al. (1990) identify Dürst et al., Proc. Natl. Acad. Sci., USA, 80, 3812-3815 (1983) as the source of their HPV-16 L1 DNA.

(8) Later research has demonstrated that the prototype HPV-16 L1 protein expressed in both of the Zhou et al. references differs substantially from the wild-type

Serial No. 08/216,506

HPV-16 L1 protein. For example, Roden et al., *J. Virol.*, 68, 7260-7266, (1994) describe that antisera produced against the prototype HPV-16 L1 proteins does not inhibit the binding of wild-type HPV-16 virus-like particles to cell surfaces. By contrast, antisera raised in rabbits to wild-type HPV-16 L1 protein did inhibit binding of wild-type HPV-16 virus-like particles to cell surfaces (see in particular the last paragraph, page 7265 of Roden et al. (*Id.*)). Also, Roden et al. describe that the prototype HPV-16 L1 contains a point mutation which makes it assemble 3 orders of magnitude less efficiently than the wild-type L1 protein. This protein has been characterized by other researchers and comprises a point mutation which changes an aspartic acid at position 202 to a histidine residue. This is described in Kimbauer et al., *Proceedings of National Academy of Science, USA*, 89, 12180-12184 (1992) and Kimbauer et al., *Journal of Virology*, 67, 6429-6436 (1993).

(9) Further evidence that the prototype HPV-16 L1 particles differ from the wild-type may be found in Zhou et al. 185 (1), 251-257, (1991) which is cited by the Examiner. Therein, at page 253, Zhou et al. specifically note that their heterogeneous HPV-16 L1 particles vary in size between 35 and 40 nanometers in diameter. By contrast, native papillomavirus particles possess a homogeneous size of 50 nanometers in diameter. Furthermore, the prototype HPV-16 L1 proteins further do not possess the characteristic icosahedral structure of native papillomavirus particles.

(10) The following additional experiment was conducted under my supervision and provides additional evidence that neither Zhou et al. reference produces L1 proteins which reproduce the conformation and antigenicity of native L1 proteins.

Serial No. 08/216,506

Experiment

In this experiment, the prototype HPV-16 L1 DNA which was expressed by Zhou et al. as well as ^{a AB9} the wild-type HPV-16 L1 DNA which lacks the mutation contained in the HPV-16 L1 prototype were both expressed in sf9 insect cells using a baculovirus vector. Uninfected cells were used as the control group.

An immunofluorescence assay was then conducted in order to test the reactivity of the prototype HPV-16 L1 protein and the wild-type HPV-16 L1 protein with monoclonal antibodies which recognized either conformational epitopes contained on the HPV-16 L1 wild-type protein or a linear epitope contained on both the prototype and wild-type HPV-16 L1 protein. More particularly, one monoclonal antibody which recognized a linear epitope and the six antibodies which were specific to conformational epitopes contained on the HPV-16 L1 protein were tested. These immunofluorescence results demonstrated that the wild-type HPV-16 L1 protein reacted with all seven monoclonal antibodies which were tested. By contrast, cells which produced the prototype HPV-16 L1 particles only reacted with the monoclonal antibody which was specific to the linear epitope and failed to react with any of the six monoclonal antibodies which were specific to conformational HPV-16 L1 epitopes. The control cells did not react with any of the seven monoclonal antibodies. Both the prototype and wild-type L1 were transported to the nucleus of infected cells and aggregated in a similar manner. However, the aggregates of the prototype were only protected by antibodies which recognized non-conformational epitopes and failed to react with antibodies which recognized HPV-16 L1 conformational epitopes.

Serial No. 08/216,506

Immunofluorescence results obtained with two of these antibodies are shown in the photograph which is attached to this Declaration as Exhibit B. In this photograph the top panel corresponds to the cells which produce the prototype HPV-16 L1 particles, the middle panel corresponds to the cells which express the wild-type HPV-16 L1 particles, and the lower panels correspond to the control group. These results clearly show that the prototype HPV-16 L1 protein failed to react with the conformational antibody. Similar results (not shown) demonstrated that the cells which produce the HPV-16 L1 prototype also failed to react with the five other conformational monoclonal antibodies which were tested. This photograph further shows that the cells which expressed the wild-type HPV-16 L1 particles reacted with both the monoclonal antibody which recognized the linear epitope and the monoclonal antibody which recognized the conformational epitope. Further, it can be seen that the control group failed to react with either of the monoclonal antibodies which were tested. In my expert opinion these results provide convincing evidence that the HPV-16 L1 DNA which was expressed by Zhou et al. fails to produce L1 proteins which exhibit the same conformation and reproduce the antigenicity of L1 proteins expressed by native, intact papillomavirus virions. Further, it is my expert opinion based on these results that the HPV-16 L1 protein which was produced by Zhou et al., given its lack of proper conformation, would be totally unsuitable for use as a vaccine for affording immunity against human papillomavirus infection.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the

Serial No. 08/216,506

like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date

3/8/95

A Bennett Jensen, M.D.
A. Bennett Jensen, M.D.

CURRICULUM VITAE

Alfred Bennett Jenson, MD
14220 Briarwood Terrace
Rockville, Maryland 20853

A. GENERAL INFORMATION

1. Born June 20, 1939 - Houston, Texas
2. Phone (work) 1-202-687-1407

B. TRAINING

1. B.A., Texas Christian University, Texas, 1957-61 (Cum Laude)
2. M.S., Baylor University (College of Medicine), Texas, 1964-66
3. M.D., Baylor College of Medicine, Texas, 1961-66, with honor
4. Internship, Department of Medicine, Baylor College of Medicine Affiliated Hospital Program, 1966-67
5. Residency, Department of Pathology, Baylor College of Medicine Affiliated Hospital Program, 1967-70
6. American Association of Immunology Summer Course, 1970
7. Research Trainee, U.S. Public Health Service, 1967-71
8. Postdoctoral Fellow of the National Multiple Sclerosis Society, 1973-75
9. Basic Program Officials Guide to Contracting, 1979

C. APPOINTMENTS

1. Chief Resident, Pathology, Ben Taub General Hospital, Houston, Texas, 1969-70
2. Instructor, Department of Pathology, Baylor College of Medicine, 1970-71
3. Instructor in Pathology, Department of Optometry, University of Houston, Texas, 1970-71
4. Comparative Pathologist, USAR, Veterinary Medicine Division, Veterinary Pathology Branch, Edgewood Arsenal, MD, 1971-73
5. Consultant, Cancer Cytology, Maryland State Department of Public Health and Hygiene, 1972-73
6. Research Associate in Immunopathology, Scripps Clinic and Research Foundation, La Jolla, CA, 1973-75
7. Senior Medical Surgeon, USPHS, Laboratory of Oral Medicine, National Institutes of Dental Research, National Institutes of Health, MD, 1975-80
8. Associate Professor, Department of Pathology, Georgetown University Schools of Medicine and Dentistry, 1980-1988; Professor, 1988-.
9. Vice-Chairman, Department of Pathology, Georgetown University Schools of Medicine and Dentistry, 1983-85
10. Acting Chairman, Department of Pathology, Georgetown University Schools of Medicine and Dentistry, 1985-89.

D. LICENSURE

1. Licensed in Texas, Maryland and Washington, DC
2. Board Certification in Anatomic Pathology, 1971
3. Board Eligible in Immunopathology

E. AWARDS

1. Sheard-Sanford Award of the American Society of Clinical Pathology, 1966
2. Salvation Army Boy's Club Service Award, 1967
3. Phi Chi Sophomore Award for Excellence in Teaching, Baylor College of Medicine. 1970
4. Army Commendation Medal, 1973
5. Nominee for Golden Apple Award for Excellence in Teaching, Georgetown University, 1982

F. MEMBERSHIP IN SCIENTIFIC SOCIETIES

1. Sigma Xi, from 1966
2. International Academy of Pathology, From 1970
3. American Association of Pathologists, From 1977

G. COMMITTEES/STUDY SECTIONS/SITE VISITS (NON-UNIVERSITY)

1. Site Visit Team, Diabetes Research Training Centers, U. Michigan, U. Iowa
2. Member, Intra-NIH Diabetes Mellitus Coordinating Committee, 1976-80
3. Chairman, Animal Care Committee, NIDR, NIH, 1978-80
4. International Committee on Taxonomy of Animal Viruses, Papovaviridae Study Group, from 1980
5. Ad Hoc Member, Research Committee (Sexually Transmitted Disease Program Projects), NIAID, NIH, 1982-84
6. Special Study Section (RFA-AM-05), Research on Autoimmunity Related to Endocrine Disease, March 11-13, 1985
7. Site Visit Team, NINCDS, NIH, Studies of Papillomas From the Upper Respiratory Tract, Long Island Jewish Medical Center, July 24-26, 1985
8. Site Visit Team, NCI, NIH, HPV; Biology, Clinical Significance and Epidemiology, Fred Hutchinson Cancer Research Center, Seattle, Washington, April 1-4, 1986.
9. Ad Hoc Member, Oral Biology and Medicine Study Section, Feb 1987, Feb 1988.
10. Special Study Sections, NCI, NIH, Epidemiology of HIV and Cancer, February 8-9, 1988, Bethesda, MD; February 12-13, 1989, Rockville, MD.
11. Site Visit Team, NCI, NIH, Hepatitis B Virus and Primary Hepatocellular Carcinoma, July 27-29, 1988, Fox Chase Cancer Center, Philadelphia, PA.
12. Chairman, Role of Human Papillomavirus Detection Tests Committee, International Society for the Study of Vulvar Disease, from 1989.
13. Special Study Section, NCI, NIH, Epidemiology of Cancer in US Ethnic/Minority Population. May 13-15, 1991, Rockville, MD.

H. SELECTED PRESENTATIONS (Since 1985)

1. Mary Lasker Conference Participant, American Cancer Society, Cancer and the Papillomavirus, Nov. 23-25, 1985
2. Invited Speaker, Ninth Peruvian Cancer Congress, Lima, Peru Nov. 26-28, 1985
3. Moderator, NCI Division of Cancer Etiology, Biological Carcinogenesis Branch. Workshop on the Transformation Mechanisms of Papillomavirus, Feb. 18-19, Bethesda, 1986
4. Speaker, Ninth International Cytology Congress, Brussels, Belgium, May 1986
5. Invited Speaker, Fourteenth International Cancer Congress, Budapest, Hungary, August, 1986
6. Moderator and Speaker, Human Papillomaviruses and Squamous Carcinoma: Second International Conference, Oct. 27-29, 1986; Third International Conference, October 24-27, 1988; Fourth International Conference, September 16-19, 1990, Chicago, Illinois.
7. Invited Speaker, Colposcopy, Cervical and Vulvar Pathology and Gynecologic Laser Surgery Post-Graduate Course, Sarasota, Florida, March 23-29, 1987, Feb.28-March 5, 1988.
8. Invited speaker, Human Papillomaviral Infection and Lower Genital Tract Neoplasia Post-Graduate Course, The Regional Cancer Center-Saint Joseph's Hospital of Atlanta, Georgia, May 7-9, 1987
9. Chairman, Vistas in Immunopathology, XIV World Congress of Pathology, Papillomavirus and Cervical Cancer, June 21-26, Washington, DC, 1987
10. Co-organizer, Sixth International Papillomavirus Workshop, Georgetown University, Washington, DC, June. 14-18, 1987.
11. Invited speaker, Antigenic Epitopes of Human papillomavirus, International Titisee Conference, HPV and Cervical Cancer, West Germany, Sept. 1987.
12. Invited speaker, HPV-Related Lesions of Sites Other than the Genital Tract, College of American Pathology, HPV Workshop-Type Consensus Meeting, New York City, March 22-23, 1988.
13. Invited Speaker, The Use of Immunohistochemistry and DNA/RNA Hybridization Techniques for Diagnosis of Human Viral Diseases, College of American Pathology Course, October 25, 1988, Las Vegas, Nevada,; March 12, 1989, Chicago, Ill.
14. Invited Speaker, Detection of Viral Infections, AMA Biotechnology and Medicine Series, DNA Probes in the Practice of Medicine, San Diego, CA, November 4, 1988 November 9, 1989.
15. Invited Speaker, Role of Human Papillomavirus in Premalignant and Malignant Lesions of the Urogenital Tract, Role of Nucleic Acid Probes in Disease Diagnosis. ASM Meetings, New Orleans, LA, May 15, 1989.

16. Moderator and Invited Speaker, Human Papillomavirus Infections. The American Society for Colposcopy and Cervical Pathology, Washington, DC, October 21-22, 1989.
17. Keynote Speaker, Advances Toward the Development of a Broadly Cross-reactive Papillomavirus Vaccine Using Molecular Technology, American College of Veterinary Pathologists, Baltimore, MD, November 4, 1989.
18. Invited Faculty and Speaker, The Use of DNA Probes for the Diagnosis of HPV in "Diagnostic Pitfalls in Gynecologic Cytopathology" ASCP Workshop, Washington, DC, November 4, 1989.
19. Invited Speaker, Immune Response to Animal Papillomavirus, Animal Models of Human Viral Diseases: Relevance to Developmental Therapeutics, Burroughs-Wellicome-UCLA Colloquium, Keystone, CO, March 31-April 5, 1990.
20. Moderator (Immune Response Session) and Invited Speaker, Ninth International Papillomavirus Workshop, Heidelberg, Germany, May 12-18, 1990.
21. Invited Participant, The Bethesda System Second Conference, Bethesda, MD, April 29,30, 1991.
22. Co-organizer and Moderator, Polymerase Chain Reaction-- A Diagnostic Tool for the 1990s. October 11, 12, Washington, DC
23. Invited Speaker, moderator and panel discussant, V. International Course on Cervical Cancer and Premalignant Lesions, October 12-14, 1991, Mexico City.

I. COMMITTEES (UNIVERSITY)

1. Infection Control Committee, GUMC, 1980-85
2. Institutional Review Board, GUMC, 1981-83
3. Animal Welfare Committee, GUMC, 1981-85
4. Chairman, Subcommittee of Infection Control Committee, Animals in the Hospital, 1981-present.
- 7 Microbiology Chairman Search Committee, 1981
- 8 Curriculum Committee, Georgetown University School of Dentistry, from 1982
7. Science Committee, Lombardi Cancer Center, from 1982
8. Medical Center Committee on Honorary Degrees, 1983
9. Director, Electron Microscopy Core Facility, Lombardi Cancer Center, 1982-85
10. Clinical Laboratory Director Search Committee, 1984.
11. Medical Executive Faculty, 1985-89.
12. Dental Executive Faculty, 1985-89.
13. Executive Staff, from 1985-89.
14. Chairman, Animal Care and Use Committee, from 1987.
15. Member, Committee on Patents, from 1988.
16. University Grievance Code Committee, from 1990

J. DEPARTMENTAL RESPONSIBILITIES

1. Director, Experimental Path. Graduate Program, 1981-85
2. Director, Dental General Pathology Course, 1982-1987.
3. Director, Electron Microscopy Unit, 1980-84, 1987-88; 1989-present.
4. Advisor, Immunocytochemistry Unit, 1980-89
5. Director, Immunofluorescence Unit, from 1982
6. Nephropathologist, from 1982
7. Director, Residency Program, 1988-1990
Co-Director, with Dr. Stan Geyer, 1990-present.

K. MISCELLANEOUS

1. Principle Investigator, NIDR, NIH - Papillomas of the Oral Cavity, 1976-80
2. Project Officer, Contract on "Etiology of Oral Cavity Papillomas", 1979-80
3. Project Officer, Contract on "Search for Diabetogenic Viruses", 1979-80
4. President, Society of Fellows, Scripps Clinic and Research Foundation, 1974-75.75
5. Ad Hoc Pathologist, American Type Culture Collection, from 1981
6. Mayor's Commission on Forensic Pathology, 1989-present

L. EDITORIAL BOARDS

1. Survey of Immunologic Research- Immunopathology Editor, From 1981
2. Survey and Synthesis of Pathology Research, Editorial board from 1982

M. GRANTS-CONTRACTS

1. Search for Papillomavirus DNA in Premalignant and Malignant Squamous Lesions of the Oral Cavity and Lower Respiratory Tracts, CTR, January 1, 1982-August 30, 1991, \$421,712, total direct costs, PI.
2. Antigen and Genome Detection of Arenavirus, Bunyavirus, and Filovirus Infections, Department of Defense, September 12, 1988-September 12, 1991, \$494,000, total direct costs, PI.
3. Antigenic Determinants of the Papillomavirus L1 Capsid Protein (RO1 CA50182-01). NCI, NIH, July 1, 1989-1992, \$227,700.00, total direct costs, PI.
4. HPV Vaccine Fund. \$65,000, total costs, Co-PI with Dr. Harald zur Hausen, US-FRG Bilateral Agreement on Cancer for Development of a Vaccine against Human Papillomavirus (HPV).

N. BIBLIOGRAPHY

1. Rabin, ER, Hassan, SA, Jenson, AB, and Melnick, JL. Coxsackievirus B3 myocarditis in mice: An electron microscopic, immunofluorescence and virus assay study. Amer. J. Pathol. 44:775-797, 1964.
2. Jenson, AB, Rabin, ER, Phillips, CA, and Melnick, JL: Reovirus encephalitis in newborn mice: An electron microscopic and virus assay study. Amer. J. Pathol. 47:223-239, 1965.
3. Jenson, AB, Rabin, ER, Bentinck, D, and Rapp, F: Reovirus viremia in newborn mice: An electron microscopic, virus assay and immunofluorescence study. Amer. J. Pathol. 49:1171-1183, 1966.
4. Jenson, AB, Rabin, ER, Wende, RD, and Melnick, JL: A comparative light and electron microscopic study of rabies and hart park virus encephalitis. Exptl. Molec. Pathol. 7:1-10, 1967.
5. Rabin, ER, and Jenson, AB: Electron microscopic studies of animal viruses with emphasis on in vivo infections. Prog. Med. Virol. 9:392-450, 1967.
6. Rabin, ER, Phillips, CA, Jenson, AB, and Melnick, JL: Vaccinia virus myocarditis in mice: An electron microscopic study. Exptl. Molec. Pathol. 4:98-111, 1965.
7. Rabin, ER, Jenson, AB, Phillips, CA, and Melnick, JL: Herpes simplex virus hepatitis in mice: An electron microscopic study. Exptl. Molec. Pathol. 8:34-48, 1968.
8. Melnick, JL, Rabin, ER, and Jenson, AB: Herpes virus factory in the form of a pentagonal dipyramidal crystal. J. Virol. 2:78-80, 1968.
9. Murphy, FA, Whitfield, SG, Coleman, PH, Calisher, CH, Rabin, ER, Jenson, AB, Melnick, JL, Edwards, MR. and Whitney, E: California group arboviruses: Electron microscopic studies. Exptl. Molec. Pathol. 9:44-56, 1968.
10. Rabin, ER, Jenson, AB, and Melnick, JL: Herpes simplex virus in mice: Electron microscopy of neural spread. Science 162:126-127, 1968.
11. Kalus, M, Jenson, AB, Rabin, ER, and Melnick, JL: Marmoset liver organ culture infected with herpes virus. Exptl. Molec. Pathol. 8:388-393, 1968.

12. Jenson, AB, and Fred, HL: Toothpick pleursy. JAMA 203:988, 1968.
13. Jenson, AB, and Fechner, RE: Ultrastructure of an intermediate Sertoli-Leydig cell tumor. A histogenetic misnomer. Lab. Invest. 21:527-535, 1969.
14. Jenson, AB, Rabin, ER, Bentinck, D, and Melnick, L: Rabiesvirus neuronitis. J. Virol. 3:265-269, 1969.
15. Jenson, AB, McCombs, RM, and Melnick, JL: Au-antigen particles. Lancet ii:311, 1969.
16. Jenson, AB, McCombs, RM, Sakurada, N, and Melnick, JL: Organ cultures inoculated with serum from a hepatitis patient with Au antigenemia. Exptl. Molec. Pathol. 13:217-230, 1970.
17. Askew, JB, Fechner, RE, Bentinck, DC, and Jenson, AB: Epithelial and myoepithelial oncocytes. Arch. Otolaryngol. 93:46-54, 1971.
18. Jenson, AB, Melnick, JL, Boyd, KR, and Wende, RD: Rapid identification of an arbovirus by observing its morphogenesis in the electron microscope. J. Inf. Dis. 123:551-554, 1971.
19. Jenson, AB, Spjut, HJ, Smith, MN, and Rapp, F: Intracellular branched tubular structures in an osteosarcoma. An ultrastructural and serological study. Cancer 27:1440-1448, 1971.
20. Acker, D, Jenson, AB, and Tenn, GK: Abdominal pregnancy with intrauterine device in situ. Obst. and Gynecol. 92:36-39, 1973.
21. Renne, RA, McLaughlin, R, and Jenson, AB: Measles virus-associated endometritis, cervicitis, and abortion in a rhesus monkey. JAVMA 163:639-641, 1973.
22. Puga, A, Jenson, AB, Boaz, J, Jensen, FC, Kohne, DE, and Lerner, RA: Molecular analysis of a murine leukemia virus produced by continuously growing thymocytes. Prog. Immunol. II, 5:15-, 1974.
23. Jenson, AB, Groff, DE, McConahey, PJ, and Dixon, FJ: Transmission of MuLV (Scripps) from parent to progeny mice: a comparison of assay systems. JNCI 57:421-424, 1976.
24. Jenson, AB, Groff, DE, McConahey, PJ, and Dixon, FJ: Transmission of MuLV (Scripps) from parent to progeny mice as determined by p30 antigenemia. Cancer Res. 36:1223-1232, 1976.

25. Prince, GA, Jenson, AB, Billups, LC, and Notkins, AL: Infection of human pancreatic beta cells with mumps virus. *Nature* 271:158-161, 1978.
26. Yoon, JW, Onodera, T, Jenson, AB, and Notkins, AL: Virus-induced diabetes mellitus. XI. Replication of Coxsackie B3 virus in human pancreatic beta cell cultures. *Diabetes* 27:778-781, 1978.
27. Onodera, T., Jenson, AB, Yoon, JW, and Notkins, AL: Virus-induced diabetes mellitus: reovirus infection of pancreatic beta cells in mice. *Science* 201:529-531, 1978.
28. Prince, GA, Jenson, AB, Horswood, RL, Camargo, E, and Chanock, RM: The pathogenesis of respiratory syncytial virus infection in cotton rats. *Amer. J. Pathol.* 93:771-791, 1978.
29. Notkins, AL, Yoon, JW, Onodera, T, and Jenson, AB: Virus-induced diabetes mellitus: Infection of mice with variants of encephalomyocarditis virus, Coxsackievirus B₄ and reovirus type 3. *In* *Treatment of Early Diabetes*, edited by RA Camerin-Davalos and B Hanover (Plenum Publishing Corp), pp 137-146, 1979.
30. Jenson, AB, Openshaw, H, Hooks, JL, Puga, A, and Notkins, AL: Herpes and other virally-induced oral diseases. *In* *Current Advances in Oral Biology*, edited by HC Slavkin and DW Cohen (Dist. Syst. Inc., Bristol, Pa), Vol. 1, no 3, pp. 1-45, 1979.
31. Dobersen, MJ, Bell, A, Jenson, AB, Ginsberg-Fellner, F, and Notkins, AL: Detection of antibodies to islet cells and insulin with paraffin-embedded pancreas as antigen. *Lancet* ii:1078, 1979.
32. Jenson, AB, Rosenthal, JD, Olson, C, Pass, F, Lancaster, WD, and Shah, K: Immunological relatedness of papillomaviruses from different species. *JNCI* 64:495-500, 1980.
33. Cramer, SF, Mandel, MM, Hauler, R, Lever, W, and Jenson, AB: Squamous cell carcinoma arising in a linear epidermal nevus. *Arch. Derm.* 117:222-224, 1981.
34. Notkins, AL, Yoon, JW, Onodera, T, Toniolo, A, and Jenson, AB: Virus-induced diabetes mellitus. *Perspectives Virol.* XI:141-, 1980.
35. Jenson, AB, Rosenberg, JH, and Notkins, AL: Virus-induced diabetes: Islet cell damage in children with fatal viral infections. *Lancet* ii:354-358, 1980.

36. Lack, EE, Jenson, AB, Smith, HG, Healy, GB, Pass, F, and Vawter, GF: Immunoperoxidase localization of human papillomavirus in laryngeal papillomas. Intervirology. 14:148-154, 1980.
37. Shah, K., Jenson, AB, Lancaster, WD, Lewis, MG, and Kurman, RW: Papillomavirus and cervical dysplasia. Lancet ii:1190, 1980.
38. Lack, EE, Vawter, GF, Smith, HG, Healy, GB, Lancaster, WD, and Jenson, AB: Immunohistochemical localization of human papillomavirus in squamous papillomas of the larynx. Lancet 2:592, 1980.
39. Onodera, T, Toniolo, A, Ray, U, Jenson, AB, Knazek, RA, and Notkins, AL: Virus-induced diabetes mellitus XX. Polyendocrinopathy and autoimmunity. J. Exptl. Med. 153:1457-1473, 1981.
40. Jenson, AB, and Dobersen, MJ: Etiopathology of diabetes. Perspect. Ped. Pathol. 7:167-183, 1982.
41. Jenson, AB, Link, CC, and Lancaster, WD: Papillomavirus etiology of oral cavity papillomas. In Viral Infections in Oral Medicine. Ed. by J. Hooks and W Jordan. (Elsevier North Holland), pp 133-146, 1982.
42. Lancaster, WD, and Jenson, AB: Evidence of papillomavirus genus-specific antigens and DNA in laryngeal papilloma. Intervirology. 15:204-212, 1981.
43. Kurman, RJ, Shah, KH, Lancaster, WD, and Jenson, AB: Immunoperoxidase localization of papillomavirus antigens in human cervical dysplasia and vulvar condylomas. Am. J. Obstet. Gynecol. 140:931-935, 1981.
44. Patterson, K, Chandra, RS, and Jenson, AB: Congenital rubella, insulinitis and diabetes mellitus in an infant. Lancet 1:1048-1049, 1981.
45. Notkins, AL, Yoon, JW, Onodera, T, Wheeler, J, and Jenson, AB: Slides on viruses and diabetes. Edited by AG Cudworth and M Bessler (Gower Med. Publishing, LTD, London, England).
46. Yoon, JW, Selvaggio, S, Onodera, T, Wheeler, J, and Jenson, AB: Infection of cultured human pancreatic B cells with reovirus type 3. Diabetologia 20:462-, 1981.

47. Jenson, AB, Lancaster, WD, Hartmann, DP, and Shaffer, L: Frequency and distribution of papillomavirus structural antigens in verrucae, multiple papillomas and condylomata of the oral cavity. *Am. J. Pathol.* 107:212-218, 1982.
48. Kurman, RJ, Sanz, LE, Jenson, AB, Perry, S, and Lancaster, WD: Papillomavirus infection of the cervix. Evidence for genus-specific antigens and DNA sequences. *Int. J. Gynecol. Pathol.* 1:17-28, 1982.
49. Kurman, RJ, Jenson, AB, and Lancaster, WD: Papillomavirus infection of the cervix. II. Relationship to intraepithelial neoplasia based on the presence of specific viral structural proteins. *Am. J. Surg. Pathol.* 7:39-52, 1983.
50. Jenson, AB, Sommer, S, Payling-Wright, C, Pass, F, Link, CC, and Lancaster, WD: Human papillomavirus: Frequency and distribution in plantar and common warts. *Lab. Invest.* 47:491-497, 1982.
51. Gaydos, DS, Goldin, H, Jenson, B, Gersten, D, Boedeker, B, Bartz, C, and Preuss, HG: Partial characterization of a renotropic factor. *Renal Physiol* 6:139-144, 1983.
52. Lass, JH, Jenson, AB, Papale, JJ, and Albert, DM: Papillomavirus in human conjunctival papillomas. *Am. J. Ophthalmol.* 95:364-368, 1983.
53. Murphy, WM, Fu, Y-S, Lancaster, WD, and Jenson, AB: Papillomavirus structural antigens in condyloma acuminata of the male urethra. *J. Urol.* 130:84-85, 1983.
54. Kurman, RJ, Jenson, AB, Sinclair, C, and Lancaster, WD: Detection of human papillomaviruses by immunocytochemistry. *In* *Advances in Immunocytochemistry*. ed. by RA DeLellis (New York:Masson), pp. 201-221, 1984.
55. Dean, P, Lancaster, WD, Chun, B, and Jenson, AB. Human papillomavirus structural antigens in squamous papillomas of the male urethra. *J. Urol.* 129:873-875, 1983.
56. Lancaster, WD, Kurman, RJ, , Sanz, L, Perry, S, and Jenson, AB: Human papillomavirus: Detection of viral DNA sequences and evidence for molecular heterogeneity in metaplasias and dysplasias of the uterine cervix. *Intervirology*. 20:202-212, 1983.
57. Jenson, AB and Rosenberg, HS: Multiple viruses in diabetes mellitus. *Prog. Med. Virol.* 29:197-217, 1984.

58. Goes, JS, Jr, Lemos, LB, Jenson, AB, Lancaster, WD, and Kurman, RJ: Presence of papillomavirus antigens in premalignant lesions of uterine cervix in Brazil. Rev. Bras. Ginec. Obstet.:46-, 1983.
59. Jenson, AB, Kurman, RJ, Lancaster, WD: Human papillomaviruses. In Textbook of Human Virology. ed. by R. Belshe (PSG, MASS), pp. 951-968, 1984.
60. Lass, JH, Grove, AS, Papale, JJ, Albert, DM, Jenson, AB, and Lancaster, WD: Detection of human papillomavirus sequences in conjunctival papilloma. Am. J. Ophthalmol. 96:670-680, 1983.
61. Warhol, MJ, Pinkus, GS, Rice, RH, Lancaster, WD, Jenson, AB, and Kurman RJ.: Papillomavirus infection of the cervix. III. The relationship of the presence of viral structural proteins to the expression of involucrin. Int. J. Gynecol. Pathol. 3:71-81, 1984.
62. Jenson, AB, Kurman, RJ, and Lancaster WD: Detection of papillomavirus common antigens in lesions of the skin and mucosa. Clinics Dermatol.3:56-63, 1985.
63. Mattison, DR, Evans, MI, Schwimmer, WB, White, BJ, Jenson, AB, and Schulman, JD: Familial premature ovarian failure. Am. J. Hum. Genet. 36:1341-1348, 1984.
64. Lancaster, WD, Kurman, RJ, and Jenson, AB: Papillomaviruses in anogenital neoplasms. In Molecular Analysis and Diagnosis of Malignancy. Ed. by AA Luderer and HH Weetall. (Humana Press, Inc.) pp. 153-183, 1986.
65. Lemos, LB, and Jenson, AB: Pathology of Aspergillosis. Aspergillosis. ed. by GE Wagner and Y Al-Doory, (CC Thomas), pp. 156-195, 1985.
66. Rams, TE, Keyes, PH, and Jenson, AB: Morphological effects of inorganic salts, chloramine-T, and citric acid on subgingival plaque bacteria. Quintessence International 15:835-844, 1984.
67. Gorra, J, Lancaster, WD, Kurman, RJ, and Jenson, AB: Bovine papillomavirus type 1 monoclonal antibodies. JNCI 75:121-123, 1985.
68. Rams, TE, Keyes, PH, and Jenson, AB: "Action de sel inorganiques, de la chloramine-T, et de l'acide citrique sur la plaque bacterienne sous-ginvivale." Odontologia 5:37-47, 1984.

69. Kurman, RJ, Jenson, AB, and Lancaster, WD: Papillomavirus infection and squamous neoplasia of the cervix. *Pathol. Res. Pract.* 179:24-30, 1984.
70. Gabriel, SA, Jenson, AB, Hartmann, D-P, and Bottomley, WK: Lichen Planus: Possible mechanisms of pathogenesis. *Oral Med.* 40:8-13, 1985.
71. Jenson, AB, Lancaster, WD, and Kurman, RJ: Uterine Cervix. In *The Pathology Of Incipient Neoplasia*. Ed. by D. Henson and Albores-Saavedra (WB Saunders Co, Phil. PA), pp. 249-263, 1986.
72. Jenson, AB, Lim, LY, and Lancaster, WD: Role of papillomavirus in proliferative squamous lesions. *Surv. Synth. Pathol. Res.* 4:8-13, 1985.
73. Lancaster, WD, Castellano, C, Santos, C., Delgado, G, Kurman, RJ, and Jenson, AB: Human papillomavirus deoxyribonucleic acid in cervical carcinoma from primary and metastatic sites. *Amer. J. Obstet. Gynecol.* 154:115-119, 1986.
74. Nakai, Y, Lancaster, WD, Lim, LY, and Jenson, AB: Monoclonal antibodies to genus- and type-specific papillomavirus structural antigens. *Intervirology*. 25:30-37, 1986.
75. Lorincz, AT, Lancaster, WD, Kurman, RJ, Jenson, AB, and Temple, G: Characterization of human papillomaviruses in cervical neoplasias and their detection in routine clinical screening. In *Viral Origins of Cervical Cancer*. Banbury Report 21. Ed R Petro and H zur Hausen. (Cold Spring Harbor Laboratory, Cold Spring Harbor, NY), pp. 225-237, 1986.
76. Strauss, M and Jenson, AB: Human papillomavirus in various lesions of the head and neck. *Otolaryngol. Head Neck Surg.* 93:342-346, 1985.
77. Rando, RF, Sedlacek, TV, Hunt, J, Jenson, AB, Kurman, RJ, and Lancaster, WD: A verrucous carcinoma of the vulva associated with an unusual type-6 human papillomavirus. *Obstet. Gynecol.* 67:70s-75s, 1986.
78. Brescia, RJ, Jenson, AB, Lancaster, WD, and Kurman, RJ: The role of human papillomaviruses in the pathogenesis and histologic classification of precancerous lesions of the cervix. *Human Pathol.* 17:552-559, 1986.

79. Lorincz, AT, Temple, GF, Campbell, GE, Jenson, AB, Kurman, RJ, and Lancaster, WD.: Correlation of cellular atypia and human papillomavirus DNA sequences in exfoliated cells of the uterine cervix. Obstet. Gynecol. 68:508-512, 1986.
80. Prince, GA, Jenson, AB, Hemming, VG, Murphy, BR, Walsh, ED, Horswood, RL, and Chanock, RM: Pulmonary pathology caused by respiratory syncytial virus (RSV) infection in the cotton rat is enhanced by prior intramuscular inoculation of formalin-inactivated RSV. J. Virol. 57:721-728, 1986.
81. Kurman, RJ, Jenson, AB, and Lancaster, WD. Papillomaviruses and cervical neoplasia: Reflections on the past, perceptions of the present and speculations for the future. In Papillomaviruses: Molecular and Clinical Aspects. Eds. P Howley and T Broker (Alan R. Liss, Inc), pp. 3-18, 1985.
82. Lass, JH, Foster, CS, Grove, AS, Rubenfeld, M, Lusk, RP, Jenson, AB, and Lancaster, WD. Interferon-alpha therapy of recurrent conjunctival papillomas. Am. J. Ophthalmol. 103:294-301, 1987.
83. Lancaster, WD, and Jenson, AB: Viruses in human cancer II. Papillomaviruses. Oncology Overview, April 1987.
84. Johnson, A., Hallman, J., Alijani, MR, Melhorn, N, Lim, LY, Jenson, AB, and Helfrich, GB. A prospective study of the clinical relevance of the current serum antiglobulin-augmented T-cell crossmatch in renal transplant recipients. Transpl. Proc. X1X:792-793, 1987.
85. Nakai, Y., Lancaster, WD and Jenson, AB: Purification of papillomavirus structural polypeptides from papillomas by immunoaffinity chromatography. J. Gen. Virol. 68:1891-1896 1987.
86. Cowser, L, Lake, P, and Jenson, AB: Topographical and conformational epitopes of bovine papillomavirus type 1 defined by monoclonal antibodies. JNCI 79:1053-1057, 1987.
87. Jenson, AB and Rosenberg, H: Pancreatic cell damage in children with fatal viral infections. IN. Virus infections and Diabetes mellitus. Ed. Y. Becker. (Martinus Nijhoff Publishing, Boston, MASS), pp. 161-187, 1987.
88. Jenson, AB, Kurman, RJ, and Lancaster, WD: HPV immunology appears promising. Contemporary OB. GYN. 28:59-65, 1986.

89. Lorincz, A, Temple, GF, Kurman, RJ, Jenson, AB, and Lancaster, WD: :Oncogenic association of specific human papillomavirus types in cervical neoplasia. JNCI 79:671-677, 1987.
90. Reid, R, Greenberg, M, Jenson, AB, Husain, M, Willett, J, Daoud, Temple, G, Stanhope, CR, Sherman, AI, Phibbs, GD, and Lorincz, A: Sexually transmitted papillomaviral infections. I. The anatomic distribution and pathologic grade of neoplastic lesions associated with different viral types. Am. J. Obstet. Gynecol. 156:212-222, 1987.
91. Jenson, AB, Kurman, RJ, and Lancaster, WD.: Tissue effects and host response to human papillomavirus infection. Obstet. Gynecol. Clinics North America 14: 397-406, 1987.
92. Lancaster, WD, and Jenson, AB: Speculations for the future of HPV and anogenital neoplasia. Obstet. Gynecol. Clinics North America 14: 601-609, 1987.
93. Barnes, W, Delgado, G, Kurman, R, Petrilli, E, Smith, D, Ahamed, C, Lorincz, A, Temple, G, Jenson, AB, and Lancaster, WD: Possible prognostic significance of human papillomavirus type in cervical cancer. Gynecol. Oncol. 29(3):267-273, 1988.
94. Roh, J-K, Jenson, A., and Rahman, A: Prevention of cardiotoxicity and nephrotoxicity in rats with multiple dosing regimen of doxorubicin entrapped in cardiolipin liposomes. J. Cancer Drug Delivery (In press).
95. Kurman, RJ, Schiffman, MD, Lancaster, WD, Reid, R, Jenson, AB, Temple, GF, and Lorincz, AT: Analysis of individual papillomavirus types in cervical neoplasia: a possible role for HPV type 18 in rapid progression. Am. J. Obstet. Gynecol. 159:293-296, 1988.
96. Cowser, L, Pilacinski, W, and Jenson, AB: Identification of the bovine papillomavirus L1 gene product using monoclonal antibodies. Virol. 165:613-615, 1988.
97. Murphy, BR, Sotnikov, A, Paradiso, PR, Hildreth, SW, Hockmeyer, WT, Jenson, AB, Lawrence, L, Zubak, JJ, Chanock, RM, Beeler, JA, and Prince, GA: Immunization of cotton rats with the fusion (F) and large (G) glycoproteins of respiratory syncytial virus (RSV) protects against RSV challenge without potentiating RSV disease. Vaccine 7:533-540, 1989.

98. Willett, GD, Kurman, RJ, Reid, RR, Greenberg, M, Jenson, AB, and Lorincz, AT: Correlation of the histologic appearance of intraepithelial neoplasia of the cervix with human papillomavirus types: emphasis on low grade lesions including so-called flat condylomas. *Int. J. Gynecol. Pathol.* 8:18-25, 1989.
99. Lancaster, WD, and Jenson, AB: Natural history of human papillomavirus infection of the anogenital tract. *Canc. Metast.* 6(4):653-664, 1987.
100. Jenson, AB, and Lancaster, WD: Association of human papillomavirus with benign, premalignant and malignant anogenital lesions. IN *Papillomavirus and Human Cancer.* ed. by H. Pfister (CRC Press, Inc.), 11-43, 1990.
101. Jin, XW, Cowsert, LM, Pilacinski, WP, and Jenson, AB: Identification of L2 Open Reading Frame Gene Products of Bovine Papillomavirus type-1 by monoclonal antibodies. *J. Gen. Virol.* 70:1133-1140, 1989.
102. Jenson, AB, Lim L-Y, and Singer, AE: Comparison of human papillomavirus type 1 serotyping by monoclonal antibodies with genotyping by in situ hybridization of plantar warts. *J. Cutaneous Pathol.* 16:54-59, 1989.
103. Luka, J, Deeb, ZE, Hartmann, DP, Jenson, B, and Pearson, GR: Detection of antigens associated with Epstein-Barr virus replication in extracts from biopsy specimens of nasopharyngeal carcinomas. *JNCI* 80:1164-1167, 1988.
104. Prince, GA, Chanock, RM, Porter, DD, Jenson, AB, Horswood, RL, and Ginsberg, HS: The pathogenesis of type 5 adenovirus pneumonia in the cotton rat (*Sigmodon hispidus*). Submitted for publication.
105. O'Brien, WM, Jenson, AB, Lancaster, WD, and Maxted, WC: Human papillomavirus typing of penile conyloma. *J. Urol.* 141:863-865, 1989.
106. Lancaster, WD, and Jenson, AB: Detection of human papillomavirus infection. IN *Molecular Genetics in Cancer Diagnosis.* Ed. J. Cossman (Elsevier, NY, Amsterdam, London), 331-348, 1990.
107. Jin, XW, Cowsert, L, Marshall, D, Reed, D, Pilacinski, W, Lim, L, and Jenson, AB. Bovine serological response to a recombinant BPV-1 major capsid protein vaccine. *Intervirol.* 31:345-354, 1990.
108. Jenson, AB. Genetic probes in the detection of human papilloma virus. *Modern Med.* 57:50-56, 1989.

109. Lim, PS, Jenson, AB, Cowsert, L, Nakai, Y, Lim, L-Y, and Sundberg, J. Distribution and specific identification of papillomavirus major capsid protein epitopes by immunocytochemistry and epitope scanning of synthetic peptides. *J. Infect. Dis.* 162:1263-1269, 1990.
110. McPherson, RA, and Jenson, AB: Laboratory Diagnosis of Viral Infections, Submitted for publication.
111. Jenson, AB, Lim, P, Ghim, S, Cowsert, Olson, C, Lim, Y-Y, Farquhar, C., and Pilacinski, W. Identification of linear epitopes of the BPV-1 L1 protein recognized by sera of infected or immunized animals. *Pathobiol.* 59:396-403, 1991.
112. Schaeffer, RC, Bitrick, MS Jr, Connolly, B, Jenson, AB, and Gong, FC. Pichinde virus induced respiratory failure in strain 13 guinea pigs: A structure-function relationship. Submitted for publication.
113. Jin, XW. Cowsert, LM, Jenson, AB, and Baker, CC. Comparison of the BPV-1 minor capsid protein purified by immunoaffinity chromatography with the L2 protein synthesized by in vitro translation. Submitted for publication.
114. Ghim, S, Christensen, ND, Kreider, JK, and Jenson, AB. Comparison of neutralization of BPV-1 infection of C127 cells and bovine fetal skin xenografts. *Int. J. Cancer* 49:285-289, 1991.
115. Cowsert, LM, Lim, P, Sundberg, JP, and Jenson, AB. Monoclonal antibodies define overlapping broadly and minimally cross-reactive BPV-1 capsid proteins. Submitted for publication.
116. Jenson, AB, Kurman, RJ, and Lancaster, WD. Tissue Effects of and Host Response to human papillomavirus infection. *Dermatologic Clinics* 9 (2); 203-209, 1991.
117. Barnes, W, Woodworth, G, Waggoner, S, Stoler, M, Jenson, AB, Delgado, G, and Dipaolo, J. Rapid dysplastic transformation of human genital cells by human papillomavirus type 18. *Gynecol. Oncol.* 38:343-346, 1990.
118. Lewandowski, G, Delgado, G, Holloway, RW, Farrell, M, Jenson, AB, and Lancaster, WD. The use of in situ hybridization to show human papillomavirus deoxyribonucleic acid in metastatic cancer cells within lymph nodes. *Am. J Obst Gynecol* 163:1333-1337, 1990.

119. Holloway, RM, Farrell, MP, Castellano, C, Barnes, WA, Lewandowski, G, Jenson, B, Santos, C, Ramirez, G, and Delgado, G. Identification of human papillomavirus type 16 in primary and recurrent cervical cancer following radiation therapy. Gynecol. Onc. 41:123-128, 1991.
120. Lorincz, AT, Reid, RR, Jenson, AB, Greenberg, MD, Lancaster, WD, and Kurman, RJ. Human papillomavirus infection of the cervix: Relative risk associations of 15 common anogenital types. Obstetrics & Gynecology 79:328-337, 1992.